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YANG, JIE

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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/511,382  
Filing Date: October 14, 2004  
Appellant(s): HAMALAINEN ET AL.

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Bruce D. Gray  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed 4/6/2009 appealing from the Office action mailed 10/9/2008.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The following are the related appeals, interferences, and judicial proceedings known to the examiner which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

5,487,819

Everett

01-1996

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

***Claim Rejections - 35 USC § 102***

Claims 1-2, 4-5, 7, 9-11 are rejected under 35 U.S.C. 102(b) as anticipated by Everett (U.S. 5,487,819, hereinafter US'819).

Regarding claim 1, the instant invention claims: "a method for recovery of gold from a leaching residue or intermediate product containing iron and sulphur, which is generated in the atmospheric chloride leaching of a copper sulphide raw material," which includes two steps: a), "...leaching the gold is from the residue product in an aqueous solution of Cu(II) chloride sodium chloride in atmospheric conditions with the aid of the bivalent copper contained in said solution and oxygen-containing gas."; and b), "keeping the oxidation-reduction potential of the suspension formed at a value below 650 mV and the pH at a value of 1-3, whereby the iron and sulphur remain mainly undissolved; the dissolved gold is recovered and discarding the undissolved residue as waste".

US'819 teaches to "...the production of metals from minerals, and more particularly to the production of base and precious metal from ores and concentrates, including the production of copper." (Col.1, Line 9-20); "The mineral can typically include sulfur-containing ores, such as pyrite..." (Col.2, Line 7-14);

Art Unit: 1793

"...the process operating at generally ambient pressure." (Col.6, Line 28-236); and "It is most typical that the electrolyte has a high chloride content and has ionic copper dissolved therein." (Col.8, Line 11-21).

Regarding step a), US'819 teaches: "In the copper electrolytic cell, cupric copper ( $\text{Cu}^{++}$  = bivalent Cu = cupric Cu --note by examiner) may also be produced at anode from any cuprous copper in the anode compartment. The cupric copper is re-circulated back to the hcl zone to further assist in leaching of mineral therein. The gold leached in hcl zone 17 is recovered in a gold recovery unit 50 by transferring a portion 14P to the gold recovery unit." (Col.10, Line 26-33, because US'819 shows a re-circulated process, leaching the gold is from the residue product in an aqueous solution – noted by examiner and refer to Fig.1). US'819 also teaches: "air or oxygen is fed to the aeration zone, typically through one or more impellers...to assist in leaching of the mineral." (Col.6, Line 24-27). "...The electrolyte is typically a high concentration sodium chloride electrolyte..." (col.6, Line 7-13 and claim 44 of US'819). Therefore, the step a) in the instant claim is anticipated by US'819.

Art Unit: 1793

Regarding step b), US'819 teaches: "...The spend catholyte has a low oxidation potential, and when contacting the electrolyte reduces the Eh of the solution to below +600mV (Ag/AgCl) causing the gold to come out of solution as elemental gold..." (Col.10, Line 40-61); US'819 also points out: "...the pH is preferably between 0.5 to 3,... The pH of the electrolyte is generally maintained below 3.5..." (Col.6, Line 28-36 and claim 45 of US'819). As shown in example 4 of US'819 (Col.16, Line 5-41), compared Au and Fe in leach residue-stage 3 and 4, Au was from 15.5ppm (stage 3) to 0.45ppm (stage 4); while Fe was from 28.4GPL (stage 3) to 23.0GPL (stage 4). (This means iron is mainly remain un-dissolved-note by examiner). "The overall copper leaching is 99% with 98% of the gold leached in the hcl zone." (Col.16, Col.25 to 41). Regarding "sulfur", US'819 teaches: "Once the mineral has been substantially leached, the process is conducted such that any sulfide sulfur in the incoming mineral is precipitated predominantly as elemental sulfur, (see equation (1), (5), and (6) below)..." (Col.6, Line 53-62). Regarding "discarding the undissolved residue as waste", US'819 teaches: "Tailings from the filtration are taken off at 77 as are sludge 23 tailings 78..." (Col.11, Line 55-64 and refer to Fig.2). Therefore, the step b) in the instant claim is anticipated by US'819.

Still regarding claim 1, US'819 teaches the process operated at generally ambient pressure (Col.6, Line 28-36), which anticipates the limitation of "at atmospheric pressure" in the instant claim.

With respect to the limitation of "aqueous solution consisting essentially of..." in the instant claim 1, the transitional language "consisting essentially of" will be constructed as equivalent to "comprising." See, e.g., PPG, 156 F.3d at 1355, 48 USPQ2d at 1355. If an applicant contends that additional steps or materials in the prior art are excluded by the recitation of "consisting essentially of," applicant has the burden of showing that the introduction of additional steps or components would materially change the characteristics of applicant's invention. In re De Lajarte, 337 F.2d 870, 143 USPQ 256 (CCPA 1964). See MPEP 2111.03. In the instant case, though US'819 prefers that the electrolyte includes two or more halides, US'819 also teaches the existing Cuprex Process involving leaching a copper concentrate with ferric chloride solution, solvent extraction of the ferric chloride solution, scrubbing, stripping and then electrolysis to produce copper (Col.2, lines 3-7 of US'819); US'819 teaches adding only NaCl in the solution (Fig.4 Curve 2 and Col.8, lines 47-61 of US'819);

Art Unit: 1793

and the appellant has not shown that the introduction of additional halide would materially change the characteristics of applicant's invention.

In conclusion, claim 1 is anticipated by US'819.

Regarding claim 2, which depends on claim 1, as discussed in rejection for claim 1, step b, US'819 teaches: "...The spend catholyte has a low oxidation potential, and when contacting the electrolyte reduces the Eh of the solution to below +600mV (Ag/AgCl) causing the gold to come out of solution as elemental gold..." (Col.10, Line 40-61 and claim 6 of US'819); The +600mV (Ag/AgCl) oxidation reduction potential as taught by US'819 is within the range of 530-620mV as recited in instant claim.

Regarding claim 4, US'819 teaches 51.2 to 62 G.P.L (gram per liter)  $\text{Cu}^{++}$  in leaching solution (col.16, Line 25-39), which is within the range of 40-100g/L as recited in instant claim.

Regarding claim 5, US'819 teaches: "...The electrolyte is typically a high concentration sodium chloride electrolyte of 250-300 grams per liter (gpl) of sodium chloride." (col.6, Line 7-13 and claim 44 of US'819). This NaCl range is within the range of 200-300g/L as recited in instant claim.

Regarding claims 7 and 9, as discussed in rejection for claim 1, step a, US'819 teaches: "air or oxygen is fed to the



Art Unit: 1793

aeration zone, typically through one or more impellers...to assist in leaching of the mineral." (Col.6, Line 24-27), which reads on the limitations of air (claim 7) or oxygen (claim 9).

Regarding claims 10-11, US'819 teaches: "...to cause the gold to come out of solution and absorb on the activated carbon. Separating the carbon with gold absorbed thereon from the electrolyte portion as a carbon/gold product; returning the gold depleted electrolyte portion to the hop zone; and recovering gold from the carbon/gold product" (Col.10, line 40-52 and claim 6 of US'819 also refer to example 4), which reads on the limitations: dissolved gold is recovered using active carbon (claim 10); and dissolved gold is recovered by electrolysis (claim 11).

### ***Claim Rejections - 35 USC § 103***

Claims 3, 6, and 8 are rejected under 35 U.S.C. 103(a) as being obvious over US'819.

Regarding claim 3, as discussed in rejection for claim 1, step b, US'819 teaches: "...the pH is preferably between 0.5 to 3,... The pH of the electrolyte is generally maintained below 3.5..." (Col.6, Line 28-36 and claim 45 of US'819). The range of pH 0.5-3 overlaps the pH ranges of 1.5-2.5 as recited in the

Art Unit: 1793

instant claim, which has established prima facie obviousness (Refer to MPEP 2144.05 I). Therefore, it would have been obvious to one of ordinary skill in the art to have chosen pH 1.5-2.5 from the disclosed range of 0.5-3 with reasonable expectation of success in the process of US'819.

Regarding claim 6, US'819 teaches: the temperature of the electrolyte is greater than 60°C and preferably ranges from 70 °C up to the boiling point of the electrolyte at ambient pressure" (Claim 47 of US'819), which overlaps the temperature range between 80°C and the boiling point of the suspension as recited in instant claim. MPEP 2144.05 I.

Regarding claim 8, as discussed in rejection for claim 1, step a, US'819 teaches: "air or oxygen is fed to the aeration zone, typically through one or more impellers...to assist in leaching of the mineral." (Col.6, Line 24-27). It does not explicitly teach oxygen-enriched air. However, refer to 2144.06 (Art recognized equivalents known for the same purpose). It is prima facie obvious to combine air and oxygen to form oxygen-enriched air to be useful for the same purpose as air or oxygen. Therefore, claim 8 is rendered obvious by US'819.

#### **(10) Response to Argument**

The appellant's arguments filed on 04/06/2009 have been fully considered but they are not persuasive.

In the remarks, appellant argues:

A) Claims 1-2, 4-5, 7, and 9-11 are not anticipated by Everett (US'819) under 35 U.S.C 102 (b) because the bromine species as taught by US'819 are excluded from the aqueous solution used to leach gold in the method recited Appellant's claims by the use of the "consisting essentially of" transitional phrase. Regarding the rejection for the limitation of "consisting essentially of" transitional phrase, the Appellant argues: first, nothing in PPG Industries v. Guardian Industries, 156 F.3d 1351, 48 USPQ2d 1351 (Fed. Cir. 1998) provides support for the office essentially ignoring "consisting essentially of" language and treating this language as if were "comprising" language as Office states it has done here; Second, the Office's characterization of the burden placed on applicants using "consisting essentially of" terminology by In re De Lajarte is incomplete and incorrect; Third, regarding In re Herz, 537 F.2d 549 (CCPA 1976) as recited in MPEP 2111.03, it does not support the broad statement of a patent applicant bearing the burden in establishing that a particular component or step is excluded from a claim by use of the "consisting essentially of" transitional phrase; Finally, Appellant's specification clearly indicates that the claimed invention is an improvement over the process of Everett (US'819) because it does not use the environmentally undesirable component bromine in the leaching solution, contrary to the teachings of Everett (US'819).

B) the instant specification clearly teaches that halox compounds in the aqueous leach solution materially affect this basic and novel characteristic—increasing oxidation potential; and Everett requires the presence of halox compounds in the aqueous leach solution. In contrast, claim 1 specifically excludes halox compounds from the leaching solution.

C) claims 3, 6, and 8 are not obvious under 35 U.S.C. 103(a) over Everett (US'819) because US'819 does not anticipate claim 1 and claims 3, 6, and 8 each depend from claim 1.

In response,

Regarding the appellant's argument A) and B), the Examiner disagrees with the appellant's arguments because firstly, as pointed in the rejection for the instant claim 1, though US'819 prefers that the electrolyte includes two or more halides, US'819 also teaches that the existing Cuprex Process involves leaching a copper concentrate with ferric chloride solution, solvent extraction of the ferric chloride solution, scrubbing, stripping and then electrolysis to produce copper (Col.2, lines 3-7 of US'819), which includes only  $\text{Cl}^-$  ions; and US'819 teaches adding only NaCl in the solution (Fig.4 Curve 2 and Col.8, lines 47-61 of US'819), which is the similar material as recited in the instant claim 1. Secondly, the appellant has not shown that the introduction of additional halide would materially change the characteristics of appellant's invention. The examiner notes the appellant argues that claimed invention is an improvement over the process of Everett (US'819), however, there is no any evidence in the record to show the asserted additional advantage as argued in Page 7, 3<sup>rd</sup> paragraph, for example, the

Art Unit: 1793

avoidance of the presence of bromine provides environmental advantages. Thirdly, although the appellant using "consisting essentially of" in the instant claim 1, the Examiner notes the copper(II) chloride, sodium chloride and oxygen-containing gas are not only components for the instant invention because iron, sulphur, and gold-containing material are also essentially including in the process (abstract and paragraphs [0006]-[0008] of the instant application) and there is no any evidence in the original application that the appellant intend to exclude other halogen ions for example,  $F^-$ ,  $Br^-$ , and/or  $I^-$ , and exclude halogen compounds from the leaching solution.

Regarding the argument C), it relates to the argument for the independent claim 1, the Examiner's position is stated as above.

**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Jie Yang/

Jie Yang, Art Unit 1793

Conferees:

/Roy King/

Supervisory Patent Examiner, Art Unit 1793

Application/Control Number: 10/511,382  
Art Unit: 1793

Page 13

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